

Fall 2006

## **USIBWC IDENTIFIES UPPER RIO GRANDE FLOOD CONTROL LEVEES IN NEED OF IMPROVEMENT**

The United States Section of the International Boundary and Water Commission (USIBWC) has informed the Federal Emergency Management Agency (FEMA) that it is unable to certify the adequacy of U.S. flood control levees along the Rio Grande between Percha Dam, New Mexico and Fort Quitman, Texas because some levee segments could be overtopped or encounter freeboard encroachment during the 100-year flood. Based on the information provided by the USIBWC, FEMA will develop a new map of the Rio Grande floodplain as if no levees existed and will determine resulting flood insurance requirements for property owners

The USIBWC has modeled the design flood (the 100-year flood) for the Canalization Project, which encompasses 131 miles of levee between Percha Dam and El Paso, and the Rectification Project, which covers 85 miles of U.S. levee between El Paso and Fort Quitman. According to these studies, the levee could be overtopped for 8 miles in the Canalization Project and 14 miles in the Rectification Project. Additionally, freeboard could be encroached for 52 miles in the Canalization Project and 19 miles in the Rectification Project. Freeboard refers to the vertical distance between the water surface elevation and the top of the levee during the design flood. USIBWC policy is to have 3 feet of freeboard in the Canalization Project and 2 feet of freeboard in the Rectification Project to ensure an acceptable margin of safety.

The most critical area is Canutillo, Texas where no levee exists on the eastern bank of the Rio Grande due to the proximity of a railroad embankment. The USIBWC is currently studying design alternatives for floodwall construction or levee improvements in this area. The agency has also released a Final Environmental Impact Statement (EIS), which includes alternatives to raise levee height for 60 miles in the Canalization Project. As part of the EIS process, the USIBWC conducted various public meetings in Las Cruces, New Mexico and El Paso to discuss proposed improvements and environmental enhancements for the flood control project. Supplemental information about the levee system was provided at public meetings of the agency's Rio Grande Citizens' Forum in 2006.

"The USIBWC identified potential weaknesses in its flood control project a number of years ago," said Acting Commissioner Carlos Marin. "We have already undertaken studies that would allow us to improve the levees in critical areas as funding becomes available."

According to current data, segments where freeboard encroachment or levee overtopping could occur include the following areas:

- immediately downstream from Rincon, New Mexico

- near Mesilla Bridge, New Mexico
- Canutillo
- the eastern levee downstream from Country Club Bridge to Sunland Park, New Mexico
- downstream from Sunland Park near the Courchesne Bridge
- El Paso between American Dam and International Dam
- El Paso near the Zaragoza Bridge
- in Hudspeth County, Texas near Acala and segments from McNary downstream to near Little Box Canyon.

Maps of the affected areas are included in a presentation available on the USIBWC web page at:

[http://www.ibwc.state.gov/PAO/Citizens\\_Forum/levee\\_certification\\_public.pdf](http://www.ibwc.state.gov/PAO/Citizens_Forum/levee_certification_public.pdf).

The EIS is available online at:

[http://www.ibwc.state.gov/EMD/Canalization/FEIS/USIBWC\\_RGCP\\_FEIS.html](http://www.ibwc.state.gov/EMD/Canalization/FEIS/USIBWC_RGCP_FEIS.html).

During the August 1, 2006 storm in El Paso, the Rio Grande experienced the highest flows in the area since 1958. Although the U.S. Rio Grande flood control levee was not overtopped during this year's storm, there was significant freeboard encroachment.

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## FINAL ENVIRONMENTAL IMPACT STATEMENT AND TECHNICAL SUPPORT DOCUMENTS

### River Management Alternatives for the USIBWC Rio Grande Canalization Project

United States Section,  
International Boundary and Water Commission

June 2004

**Select a link below to view the full text of the Final EIS, or individual sections of the report:**

- [Letter from Arturo Q. Duran, Commissioner, USIBWC](#)
- [Full Text of the Report](#) (excluding appendices)
- [Executive Summary](#)
- [Chapter I](#) - Additions and Modifications to the Draft EIS
- [Chapter II](#) - Response to Draft EIS Comments
- [Appendix J](#) - Cross-referencing Index of Comments and Responses
- [Appendix K](#) - Correspondence on Draft EIS
- [Appendix L](#) - Public Hearing Transcript
- [Appendix M](#) - Additional Cultural Resources Consultation
- [Appendix N](#) - Socioeconomic Effects Analysis Support Documentation
- [Appendix O](#) - Act of Congress Authorizing USIBWC to Construct, Operate and Maintain the RGCP
- [Appendix P](#) - USFWS Letter of Concurrence with Findings of the RGCP Biological Assessment

### *Links to Technical Documents*

- December 2003 [Draft EIS](#)
- January 2004 [Biological Assessment](#)
- August 2003 [Reformulation Report](#)
- March 2001 [Alternatives Formulation Report](#)

# **Rio Grande Citizen's Forum**

## **February 15, 2006**

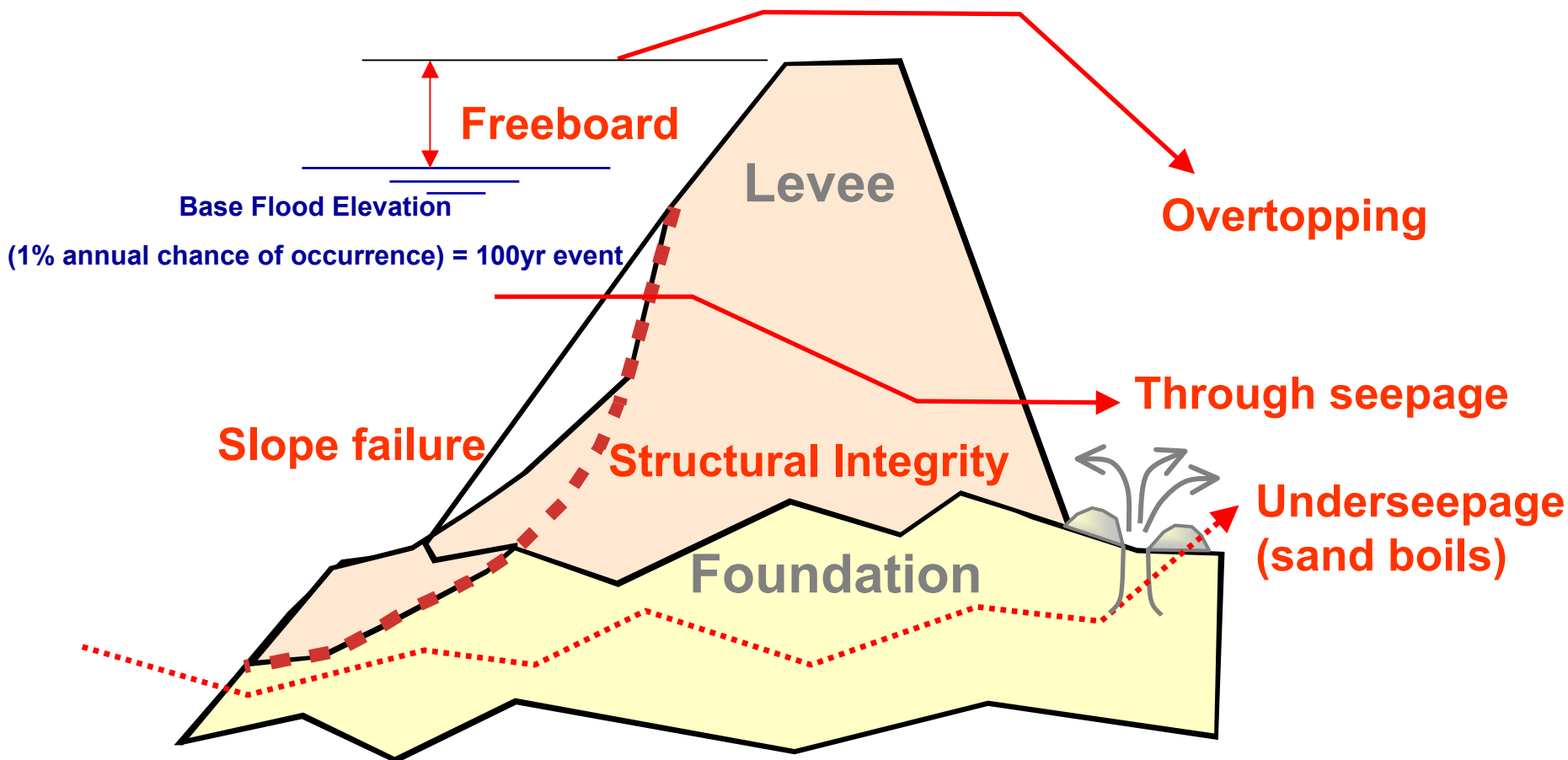
### **FEMA Levee Certification**



# Levee Terminology

River side

Land side



# USIBWC Involvement in Levee Certification



- Sep 2005 - Letter from FEMA requesting USIBWC:
  - certify levees provide for 1 percent annual chance flood event protection,
  - certify proper maintenance
  - provide up-to-date hydraulic models
- Nov 2005 - Meeting with FEMA to discuss request
- Feb 2006 - USIBWC response letter to FEMA
  - Include latest hydraulic models (FLO-2D Canalization, HECRAS Rectification)
  - Note: Developing FLO-2D model for Rectification**
  - Levee deficiency maps.
  - Certify non-deficient levee
  - Request continued interagency coordination
  - USIBWC will seek “AR” flood zone designation for non-certifiable levee segments

# Federal Emergency Management Agency (FEMA)

## Certification Criteria



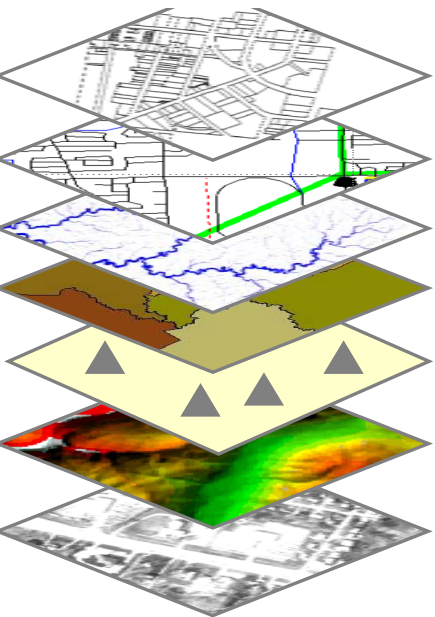
- ✓ Minimum of 3 ft freeboard above base flood elevation, with additional 1 foot of freeboard around structures & where flow is constricted, such as bridges.
- ✓ Geotechnical/structural analyses that address closures, embankment and foundation stability, and settlement to demonstrate that the levee foundations and embankments will remain stable during the base flood.
- ✓ An operation and maintenance plan to ensure the continued flood protection capacity of the levee system in the future.

**Note: FEMA allows USIBWC to set its own freeboard requirements (2ft by treaty) and make levee structural integrity determination.**

# Structural Integrity of USIBWC Levees



The USIBWC contracted the U.S. Army Engineer Research Development Center (ERDC) to perform an integrated condition assessment of the USIBWC Canalization and Rectification projects using airborne geophysics, geologic studies, ground truth investigations and enterprise Geographic Information System.



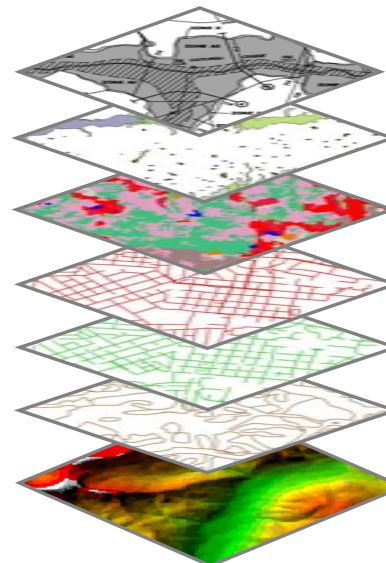
**Baseline Data**  
Topographic Maps  
Transportation  
Surface Waters  
Boundaries  
Engr. Borings  
Elevation  
Aerial Photos



**Airborne Equipment**



**Test Pond Study**



**Other Data**  
Geology  
Segments  
Borrow pits  
Utilities  
Levee drains  
Soils  
LiDAR,  
EM data



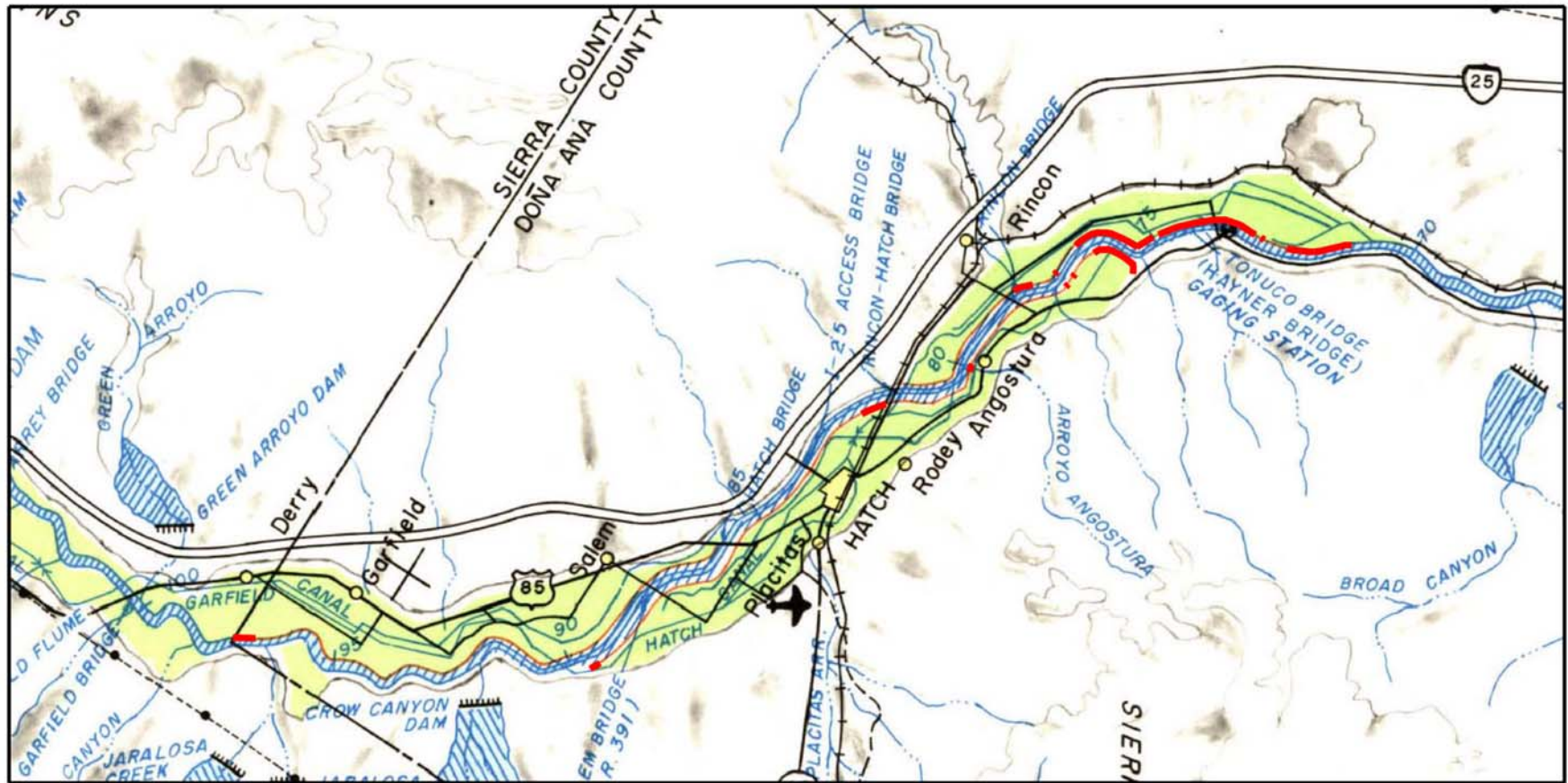
# USIBWC will certify to FEMA

- Upon examination of the ERDC condition assessment findings and current hydraulic models, the USIBWC will certify to FEMA all levee segments in the Canalization and Rectification projects that meet or exceed USIBWC freeboard requirements of 2 feet.
- The following maps identify levee segments which the USIBWC cannot certify at this time due to freeboard encroachment or levee overtopping.

# Canalization - Levee Deficiency



SHEET 1 of 3



CANALIZATION

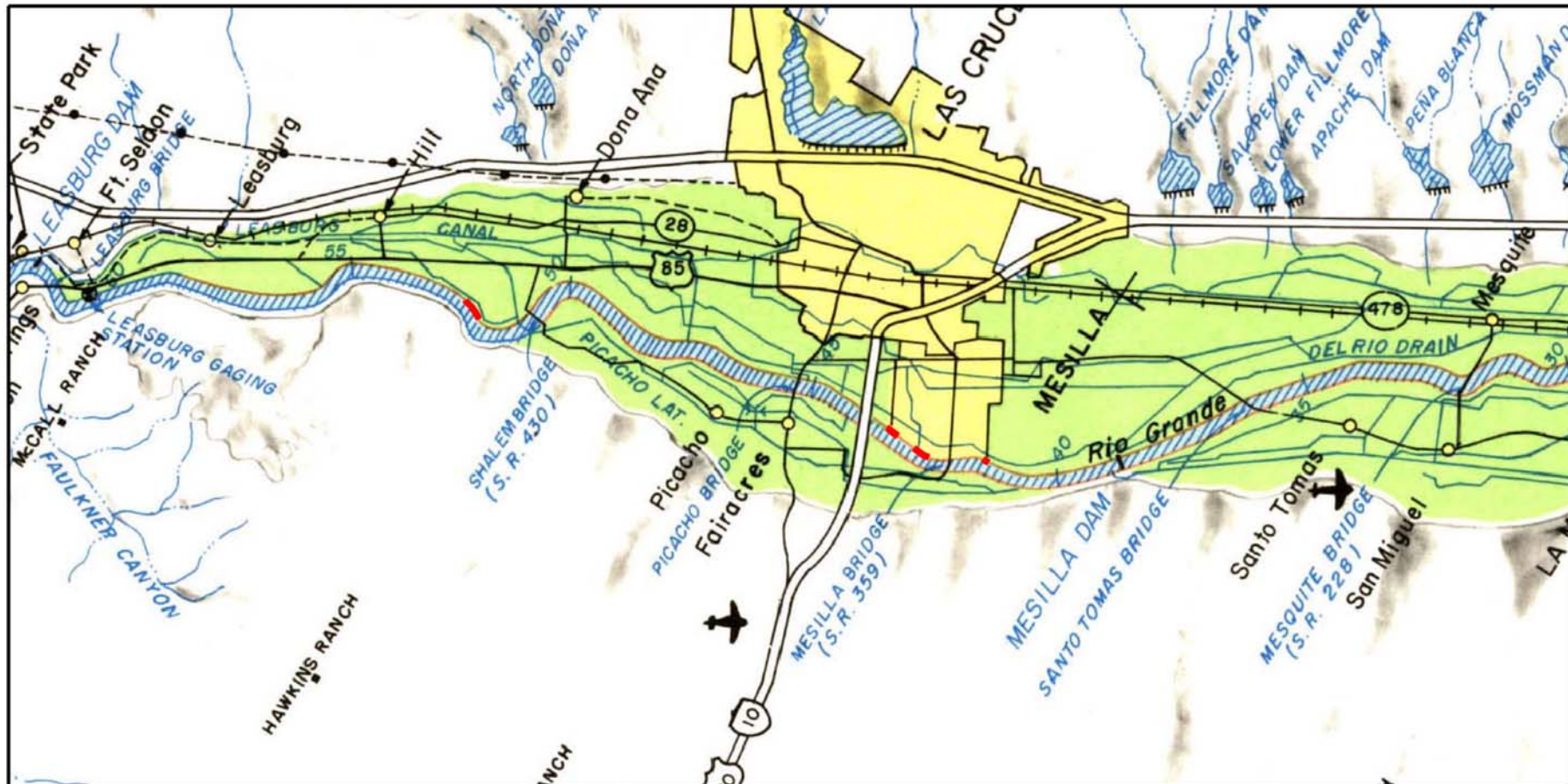


LEVEE WITH LESS THAN  
2' FREEBOARD

# Canalization - Levee Deficiency



SHEET 2 of 3



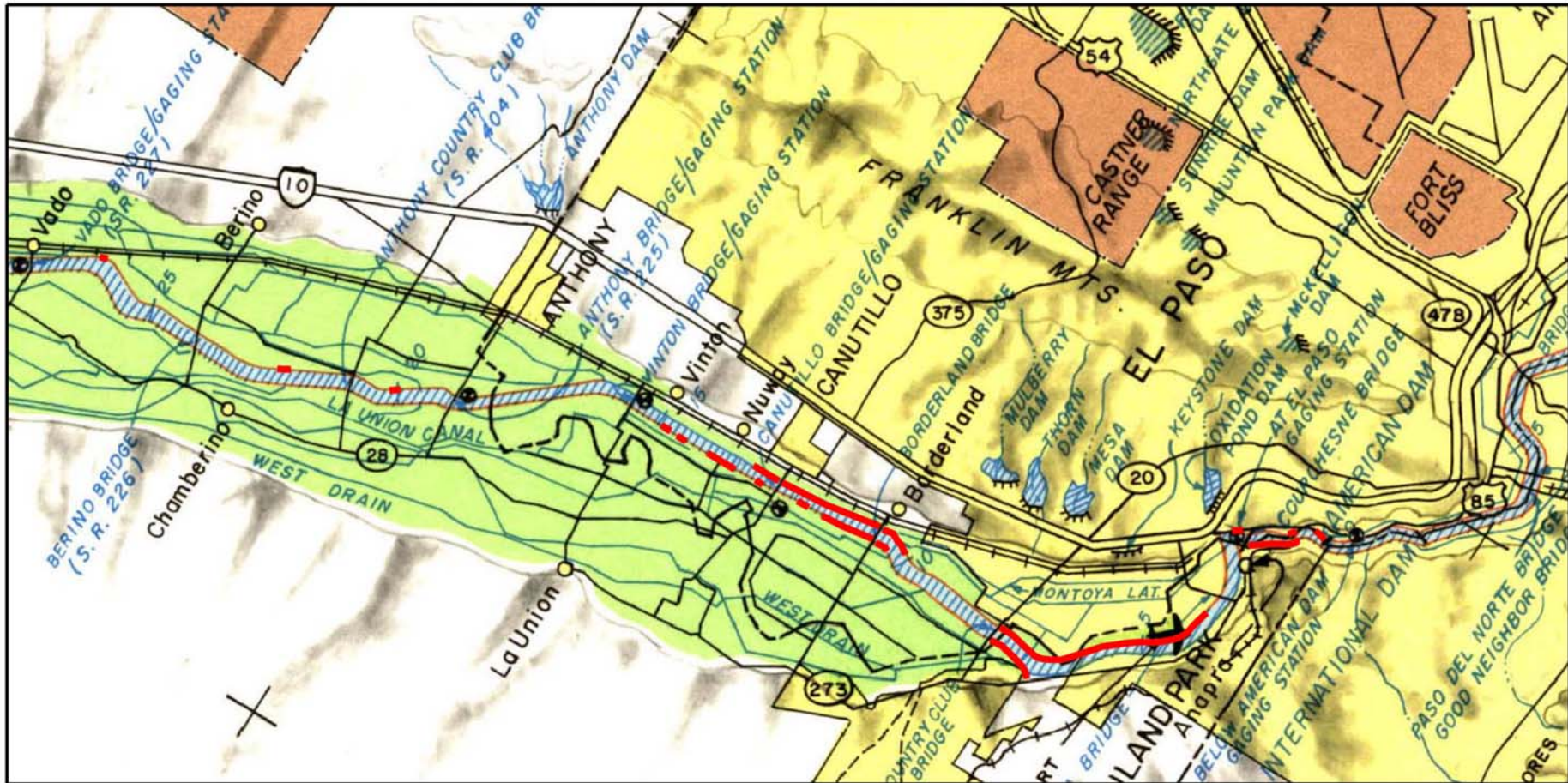
CANALIZATION

LEVEE WITH LESS THAN  
2' FREEBOARD

# Canalization - Levee Deficiency



SHEET 3 of 3



CANALIZATION

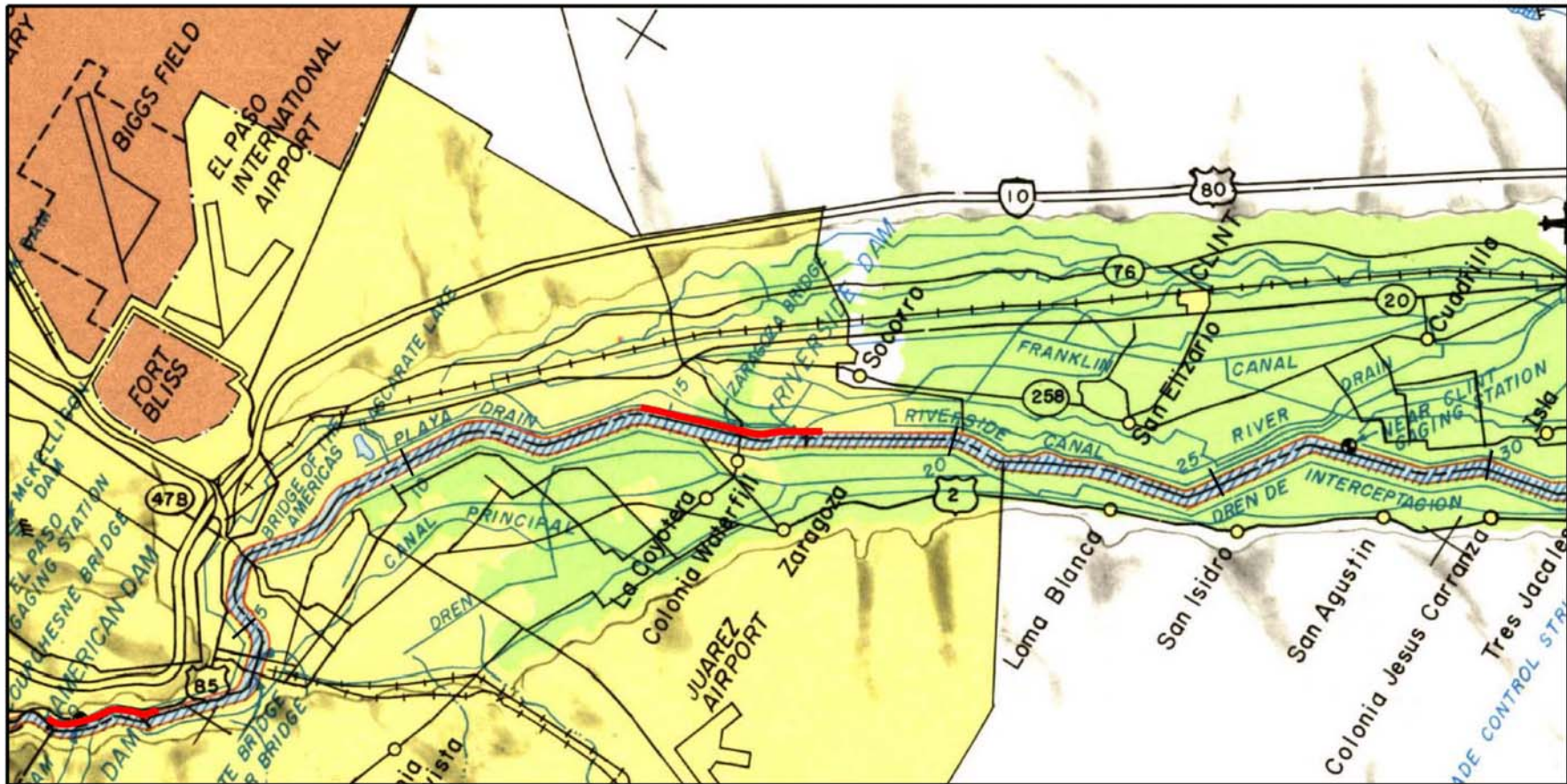


LEVEE WITH LESS THAN  
2' FREEBOARD

# Rectification - Levee Deficiency



SHEET 1 of 3



RECTIFICATION

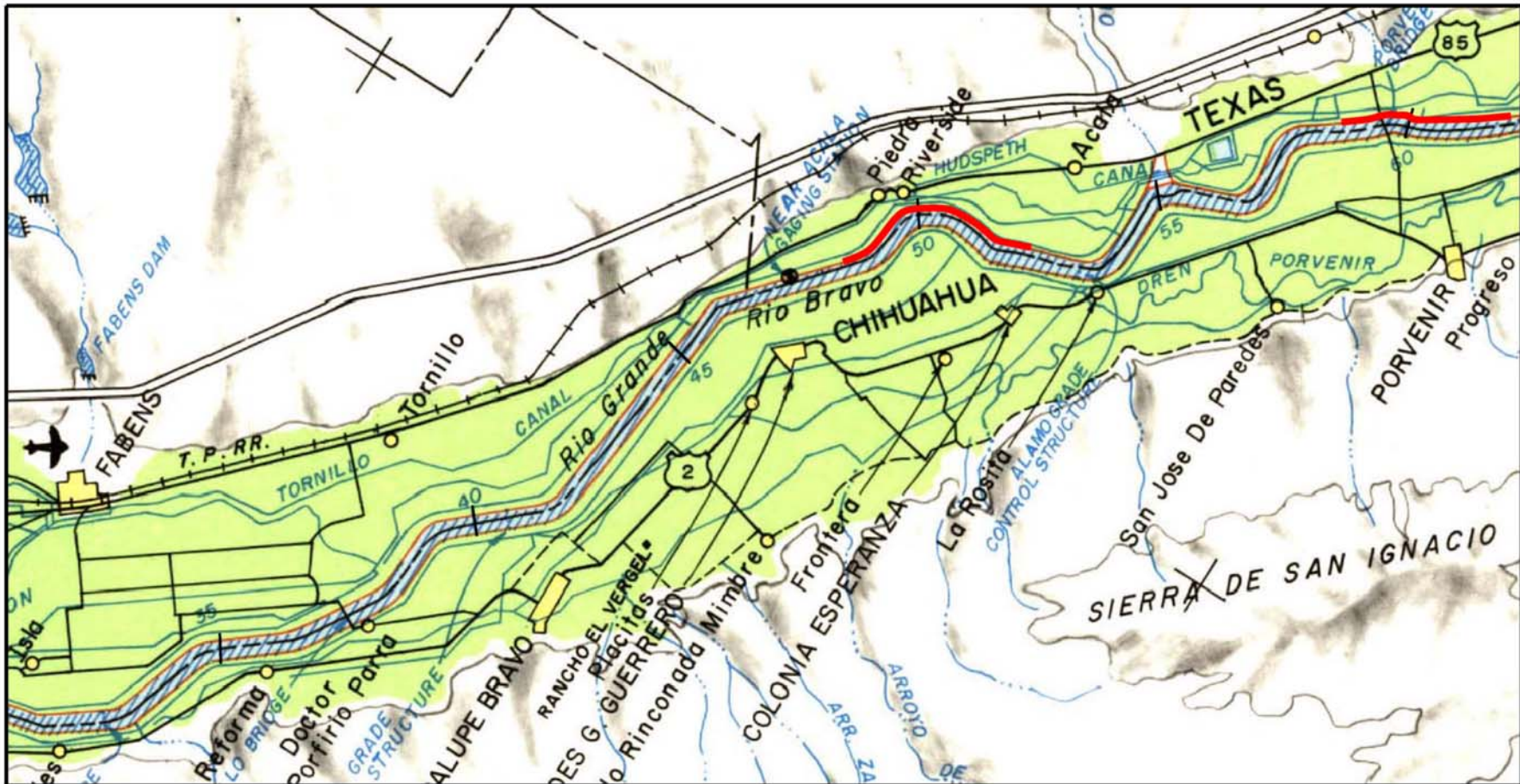


LEVEE WITH LESS THAN  
2' FREEBOARD

# Rectification - Levee Deficiency



SHEET 2 of 3

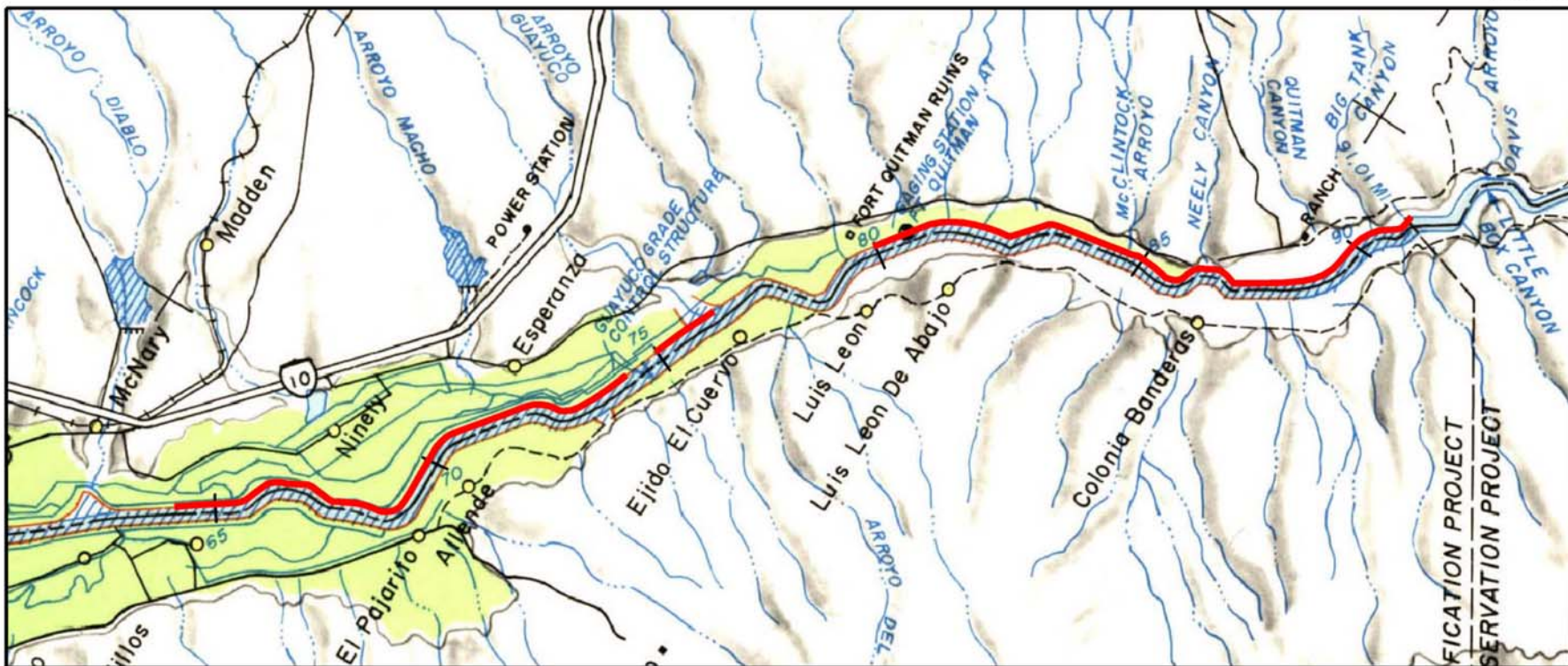


RECTIFICATION

 LEVEE WITH LESS THAN 2' FREEBOARD

# Rectification - Levee Deficiency

SHEET 3 of 3



RECTIFICATION

 LEVEE WITH LESS THAN 2' FREEBOARD



## **What should the Public expect?**

FEMA will revise flood insurance rate maps to properly identify flood risk for Dona Ana and El Paso counties using data provided by USIBWC.

# Community Floodplain Management and Map Adoption



- **Preliminary DFIRM to the Community**
- **Presentation of Preliminary DFIRM to Community (also known as CCO Meeting)**
- **90-Day Appeal Period**
- **Appeal Resolution**
- **Letter of Final Determination (LFD)**
- **6 Month Compliance (Map Adoption) Period**
- **Final adoption and/or revision of Floodplain Management Ordinance**
- **Effective DFIRM**



## Definitions of FEMA Flood Zone Designations

### Zones indicating mandatory purchase of flood insurance in participating communities

ZONE	DESCRIPTION
A	Areas subject to a one percent or greater annual chance of flooding in any given year. Because no detailed hydraulic analyses have been performed on these areas, no base flood elevations are shown.
AE, A1 - A30	Areas subject to a one percent or greater annual chance of flooding in any given year. Base flood elevations are shown as derived from detailed hydraulic analyses (Zone AE is used on new and revised maps in place of Zones A1-A30).
AH	Areas subject to a one percent or greater annual chance of shallow flooding in any given year. Flooding is usually in the form of "ponding" with average depths between one and three feet. Base flood elevations are shown as derived from detailed hydraulic analyses.
AO	Areas subject to a one percent or greater annual chance of shallow flooding in any given year. Flooding is usually in the form of sheet flow with average depths between one and three feet. Average flood depths are shown as derived from detailed hydraulic analyses.
AR	Areas subject to a one percent or greater annual chance of flooding in any given year, due to a temporary increase in flood hazard from a flood control system providing less than its previous level of protection.
A99	Areas subject to a one percent or greater annual chance of flooding in any given year, but will ultimately be protected by a flood protection system under construction. No base flood elevations or flood depths are shown.
V	Areas along coasts subject to a one percent or greater annual chance of flooding in any given year that also have additional hazards associated with velocity wave action. Because no detailed hydraulic analyses have been performed on these areas, no base flood elevations are shown.
VE, V1 - V30	Areas along coasts subject to a one percent or greater annual chance of flooding in any given year with additional hazards associated with velocity wave action. Base flood elevations are shown as derived from detailed hydraulic analyses. (Zone VE is used on new and revised maps in place of Zones V1-V30).

### Zones indicating non-mandatory (but available) purchase of flood insurance in participating communities

ZONE	DESCRIPTION
D	Areas of undetermined flood hazard where flooding is possible.
X, C	Areas of minimal flood hazard from the principal source of flood in the area and determined to be outside of the 0.2 percent annual chance floodplain. (Zone X is used on new and revised maps in place of Zone C).
X (Shaded), X500, B	Areas of moderate flood hazard from the principal source of flood in the area and determined to be between the limits of the one percent annual chance floodplain and the 0.2 percent annual chance floodplain. (Shaded Zone X is used on new and revised maps in place of Zone B).
XFUT	For communities which elect to incorporate future floodplain conditions into their FIRMs, the future flood zone shown on the new map indicates the areas which the community believes will become the one percent annual chance floodplain (or the future Special Flood Hazard Area) due to projected urban development and land use.
None	Areas of undetermined flood hazard that do not appear on a Flood Insurance Rate Map or Flood Hazard Boundary Map where flooding is possible.



Non-certifiable levees →

USIBWC will request →

Certifiable levees →

# FEMA Zone X Designation



X, C	Areas of minimal flood hazard from the principal source of flood in the area and determined to be outside of the 0.2 percent annual chance floodplain. (Zone X is used on new and revised maps in place of Zone C).
X (Shaded), X500, B	Areas of moderate flood hazard from the principal source of flood in the area and determined to be between the limits of the one percent annual chance floodplain and the 0.2 percent annual chance floodplain. (Shaded Zone X is used on new and revised maps in place of Zone B).

Zones B, C, and X are the flood insurance rate zones that correspond to:

- areas outside the 100-year floodplains,
- areas of 100-year sheet flow flooding where average depths are less than 1 foot,
- areas of 100-year stream flooding where the contributing drainage area is less than 1 square mile, or
- areas protected from the 100-year flood by levees.

No BFEs or depths are shown within this zone.

# FEMA Zone A Designation



A

Areas subject to a one percent or greater annual chance of flooding in any given year. Because no detailed hydraulic analyses have been performed on these areas, no base flood elevations are shown.

Flood insurance rate zone that corresponds to the 100-yr floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations or depths are shown within this zone. **Mandatory flood insurance purchase requirements apply.**

# FEMA Zone AR Designation



AR

Areas subject to a one percent or greater annual chance of flooding in any given year, due to a temporary increase in flood hazard from a flood control system providing less than its previous level of protection.

Flood insurance rate zone used to depict areas **protected from flood hazards by flood control structures, such as a levee, that are being restored**. FEMA will consider using the Zone AR designation for a community if the flood protection system has been **deemed restorable by a Federal agency** in consultation with a local project sponsor; a minimum level of flood protection is still provided to the community by the system; and restoration of the flood protection system is scheduled to begin within a designated time period and in accordance with a progress plan negotiated between the community and FEMA. **Mandatory purchase requirements for flood insurance will apply, but the rate will not exceed the rate for unnumbered A zones** if the structure is built in compliance with Zone AR floodplain management regulations.



# **FEMA Contact Information**

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